IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-21. (Canceled)

22. (Currently Amended) A method of conditioning and removing scale and deposits from free span tube surfaces within a heat exchange system that utilizes at least one heat transfer liquid to which heat is transferred via the free span tube surfaces, the method comprising:

taking the heat exchange system out of service;

providing in the heat exchange system an aqueous cleaning solution of a scale conditioning agent, the scale conditioning agent comprising a chelant and a reducing agent, the chelant being present in the aqueous cleaning solution at a treatment concentration of less than about 1 weight percent, wherein the free span tube surfaces have scale and deposits accumulated thereon when the aqueous solution is provided in the heat exchange system;

removing substantially all of the aqueous cleaning solution from the heat exchange system after a treatment period; and

returning the heat exchange system to service.

23. (Previously Presented) The method of claim 22, further comprising:

before providing in the heat exchange system the aqueous cleaning solution, removing at least a portion of the heat transfer liquid from the heat exchange system; and

after removing substantially all of the aqueous cleaning solution from the heat exchange system, introducing replacement heat transfer liquid.

24. (Canceled)

25. (Currently Amended) The method of claim [24]22, wherein the scale conditioning agent further comprises a pH control agent.

26. (Previously Presented) The method of claim 25, further comprising maintaining the aqueous cleaning solution at a treatment pH of between pH 3.5 and pH 9 during the treatment period.

27. (Previously Presented) The method of claim 26, wherein the treatment pH is between pH 4.5 and pH 6.

28. (Previously Presented) The method of claim 25, wherein the scale conditioning agent further comprises a non-ionic surfactant.

29. (Previously Presented) The method of claim 25, wherein:

the chelant comprises at least one chelant selected from a group consisting of EDTA, HEDTA, lauryl substituted EDTA, and polyaspartic acid with imminodisuccinate;

the reducing agent comprises at least one reducing agent selected from a group consisting of ascorbic acid, isomers of ascorbic acid, citric acid, hydrazine, catalyzed hydrazine, and carbohydrazide; and

the pH control agent is a nitrogen containing aliphatic compound having fewer than 10 carbons such as triethanolamine, dimethylamine, ethylamine, 1,2–diaminoethane, diaminopropane, ethanolamine, diethanolamine, 2-methyl-2-amono-1-propanol, 5-aminopentanol, or methoxypropylamine.

30. (Previously Presented) The method of claim 22, wherein providing in the heat exchange system the aqueous cleaning solution of a scale conditioning agent comprises introducing the aqueous cleaning solution into the heat exchange system.

31. (Previously Presented) The method of claim 22, wherein providing in the heat exchange system the aqueous cleaning solution of a scale conditioning agent comprises forming the aqueous cleaning solution in the heat exchange system.

32. (Previously Presented) The method of claim 22, further comprising, prior to removing substantially all of the aqueous cleaning solution from the heat exchange system, circulating the aqueous cleaning solution within the heat exchange system during the treatment period.

33. (Previously Presented) The method of claim 32, further comprising introducing additional scale conditioning agent during the circulating the aqueous cleaning solution.

34. (Previously Presented) The method of claim 33, wherein the additional scale conditioning agent is introduced into the heat exchange system as a concentrated premix solution, the introduction of the additional scale conditioning agent being sufficient to maintain the chelant at the treatment concentration.

35. (Previously Presented) The method of claim 22, further comprising maintaining the aqueous cleaning solution at a treatment temperature of less than 100°C during the treatment period.

36. (Previously Presented) The method of claim 35, wherein the treatment temperature is less than 60°C.

37. (Previously Presented) The method of claim 22, further comprising agitating the aqueous cleaning solution during the treatment period.

38. (Previously Presented) The method of claim 37, wherein the agitating the aqueous cleaning solution comprises flow induced mixing, inert gas sparging, or a combination of the two methods.

39. (Previously Presented) The method of claim 22, wherein the treatment concentration is between 0.05 and 0.25 weight percent.

40. (Previously Presented) The method of claim 22, further comprising, before returning the heat exchange system to service,

introducing an aqueous rinse solution into the heat exchange system;

performing at least one hydro-mechanical cleaning operation; and

removing substantially all of the aqueous rinse solution; and

introducing replacement heat exchange liquid into the heat exchange system.

41. (Previously Presented) The method according to claim 22, wherein the heat exchange system comprises a steam generator.

42. (Previously Presented) The method according to claim 22, wherein the steam generator comprises a nuclear steam generator.

43. (Currently Amended) The method according to claim 22, wherein the method induces corrosion of less than 0.001 inch per application in carbon and low allow steels between taking the heat exchange system out of service and returning the heat exchange system to service.

44. (Currently Amended) The method according to claim 22, further comprising increasing a porosity of an iron oxide portion of deposits in the heat exchange system before removing substantially all of the aqueous cleaning solution from the heat exchange system.

45. (Currently Amended) The method according to claim 22, wherein:

the heat exchange system forms part of a secondary side of a nuclear steam generator; and

the method further ~~comprising~~ comprises releasing the used aqueous cleaning solution into the environment as conventional industrial waste, rather than radioactive waste.

46. (Currently Amended) A method of conditioning and removing scale and deposits within a heat exchange system that utilizes at least one heat transfer liquid, the method comprising:

taking the heat exchange system out of service;

providing in the heat exchange system an aqueous cleaning solution of a scale conditioning agent, the scale conditioning agent comprising a chelant and a reducing agent;

removing substantially all of the aqueous cleaning solution from the heat exchange system after a treatment period;

returning the heat exchange system to service; and

between taking the heat exchange system out of service and returning the heat exchange system to service, inducing corrosion of less than 0.001 inch in carbon and low allow steels.

47. (Previously Presented) The method according to claim 46, wherein, between taking the heat exchange system out of service and returning the heat exchange system to service, the inducing corrosion comprises inducing corrosion of between 0.0002 and 0.0003 inch in carbon and low allow steels.

48. (Currently Amended) The method according to claim 46, further comprising increasing a porosity of an iron oxide portion of deposits in the heat exchange system before removing substantially all of the aqueous cleaning solution from the heat exchange system.

49. (Currently Amended) The method according to claim 46, wherein:

the heat exchange system forms part of a secondary side of a nuclear steam generator; and

the method further ~~comprising~~ comprises releasing the used aqueous cleaning solution into the environment as conventional industrial waste, rather than radioactive waste.

50. (Currently Amended) A method of conditioning and removing scale and deposits within a heat exchange system that utilizes at least one heat transfer liquid, the method comprising:

taking the heat exchange system out of service;

providing in the heat exchange system an aqueous cleaning solution of a scale conditioning agent, the scale conditioning agent comprising a chelant and a reducing agent;

increasing a porosity of an iron oxide portion of deposits in the heat exchange system;

removing substantially all of the aqueous cleaning solution from the heat exchange system; and

returning the heat exchange system to service.

51. (Currently Amended) A method of conditioning and removing scale and deposits within a heat exchange system that forms part of a secondary side of a nuclear steam generator and ~~that~~ utilizes at least one heat transfer liquid, the method comprising:

taking the heat exchange system out of service~~, the heat exchange system comprising a nuclear steam generator~~;

providing in the heat exchange system an aqueous cleaning solution of a scale conditioning agent, the scale conditioning agent comprising a chelant and a reducing agent;

removing substantially all of the aqueous cleaning solution from the heat exchange system; and

releasing the used aqueous cleaning solution into the environment as conventional industrial waste, rather than radioactive waste.

52. (New) The method of claim 22, wherein no cleaning techniques are used to remove scale and deposits from free span tube surfaces between the taking of the heat exchange system out of service and the providing in the heat exchange system of the aqueous solution.

53. (New) The method according to claim 50, wherein increasing the porosity comprises increasing the porosity of the iron oxide portion of deposits on free span tube surfaces of a secondary side of the heat exchange system.

54. (New) The method according to claim 51, wherein no cleaning techniques are used to remove scale and deposits from the secondary side of the nuclear steam generator between the taking of the heat exchange system out of service and the providing in the heat exchange system of the aqueous solution.

55. (New) The method of claim 22, further comprising between providing in the heat exchange system the aqueous cleaning solution and removing substantially all of the aqueous cleaning solution, chelating and removing iron oxide deposits from within the heat exchange system.

56. (New) The method of claim 22, further comprising maintaining the treatment concentration at a uniform level between providing the aqueous cleaning solution in the heat exchanger and removing substantially all of the aqueous cleaning solution.